SEQUENCE LISTING

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SUZUKI, SONOKO
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ABE, ISAO

<120> METHOD FOR PRODUCING TRIPEPTIDES AND/OR PEPTIDES LONGER THAN TRIPEPTIDES

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<150> PCT/JP03/09466
<151> 2003-07-25

<150> JP 2002-218958
<151> 2002-07-26

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<170> PatentIn version 3.1

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Val Lys Lys Leu Thr Leu Lys Val Thr Leu Leu Thr Leu Leu Leu Gly
1 5 10 15

agt aca gtt gga ttt gcg caa gat gca aaa gca gat tct gct tat gtg 156
Ser Thr Val Gly Phe Ala Gln Asp Ala Lys Ala Asp Ser Ala Tyr Val
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Arg Asp Asn Tyr Glu Lys Ile Glu Gln Val Ile Pro Met Arg Asp Gly
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Val Asn Glu Tyr Lys Lys Ser Leu Gly Asn Phe Pro Thr Glu Met Arg
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gaa ggt ttt att ttt gtt tac caa gat gtg aga gga aaa tgg atg agc 396
Glu Gly Phe Ile Phe Val Tyr Gln Asp Val Arg Gly Lys Trp Met Ser
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115 120 125

aag gca att gac gaa agc aca gat aca ttt gat acg cta gaa tgg ctt 492
Lys Ala Ile Asp Glu Ser Thr Asp Thr Phe Asp Thr Leu Glu Trp Leu
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Ala Lys Asn Leu Lys Asn Tyr Thr Lys Lys Ala Gly Ile Tyr Gly Ile
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tcg tat cct ggt ttt tat tcg aca atg agt ttg gtt aat tcg cat cca      588
Ser Tyr Pro Gly Phe Tyr Ser Thr Met Ser Leu Val Asn Ser His Pro
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act cta aaa gcc gtt tcg cca caa gcg ccc gtt acc aat tgg ttt tta      636
Thr Leu Lys Ala Val Ser Pro Gln Ala Pro Val Thr Asn Trp Phe Leu
            180                 185                 190

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gat aat atc aag ttt tac aat gat tta ttt gcg cat cca gat tac gat      876
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Gln Phe Trp Gln Asp Arg Asn Val Leu Pro His Leu Thr Asn Val Gln
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cct gct gta atg acg gtt gga ggt ttt ttt gat gca gaa gat gtc tac      972
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agc aac gga agt act ttt gga gat atg caa ttt gca tcg aat aca agt     1116
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aaa gat aaa ggt aat ttt aaa cca acc gaa gct aca att ttt att acg      1212
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aca aca caa aaa att tat ttg caa caa aat ggt aaa ata gct ttt aat      1308
Thr Thr Gln Lys Ile Tyr Leu Gln Gln Asn Gly Lys Ile Ala Phe Asn
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Lys Thr Asn Thr Thr Thr Thr Phe Asp Glu Tyr Val Ala Asp Pro Asn
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tct cca gtt cct tat tca gga gga gtt tta gaa act cgt tca aga gaa      1404
Ser Pro Val Pro Tyr Ser Gly Gly Val Leu Glu Thr Arg Ser Arg Glu
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tat atg gtc gat gat caa cgc ttt gct tct act cgt cct gat gtt atg      1452
Tyr Met Val Asp Asp Gln Arg Phe Ala Ser Thr Arg Pro Asp Val Met
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gtg tat caa tct gat att ttg aca gaa gat att acg ctt gct ggt cct      1500
Val Tyr Gln Ser Asp Ile Leu Thr Glu Asp Ile Thr Leu Ala Gly Pro
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Thr Ser Lys Asp Tyr Leu Lys Gln Thr Gln Arg Ile Tyr His Thr Ser
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Tyr Pro Val Leu Leu Asn Arg Thr Pro Tyr Thr Val Ala Pro Tyr Gly
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Glu Gly Phe Ile Phe Val Tyr Gln Asp Val Arg Gly Lys Trp Met Ser
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Glu Gly Glu Phe Glu Asp Val Arg Pro Ile Asn Pro Ser Lys Ser Lys
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Gly Asp Asp Phe His His Asn Gly Val Leu Phe Leu Asn Asp Ser Phe
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Ser Phe Met Thr Phe Phe Gly Val Lys Arg Pro Gln Pro Ile Thr Pro
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Asp Lys Gly Pro Lys Arg Phe Glu Tyr Pro Ile Lys Asp Asn Tyr Arg
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Phe Tyr Ala Ser Gly Ser Val Lys Glu Leu Lys Asp Lys Tyr Leu Gln
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Lys Asp Lys Gly Asn Phe Lys Pro Thr Glu Ala Thr Ile Phe Ile Thr
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Gly Ser Asn Glu Trp Lys Gln Phe Asp Ala Trp Pro Pro Lys Asn Val
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Lys Thr Asn Thr Thr Thr Thr Phe Asp Glu Tyr Val Ala Asp Pro Asn
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Ser Pro Val Pro Tyr Ser Gly Gly Val Leu Glu Thr Arg Ser Arg Glu
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Tyr Met Val Asp Asp Gln Arg Phe Ala Ser Thr Arg Pro Asp Val Met
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Val Tyr Gln Ser Asp Ile Leu Thr Glu Asp Ile Thr Leu Ala Gly Pro
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Val Ile Asn His Leu Val Val Ser Thr Thr Gly Thr Asp Ala Asp Tyr
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Asn Lys Leu Met Ala Gly Tyr Gln Asn Leu Ile Arg Ala Glu Ile Met
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Arg Gly Lys Tyr Arg Asn Ser Phe Ser Asn Pro Glu Ala Met Val Pro
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Phe Lys Lys Gly His Arg Ile Met Ile Gln Val Gln Asn Ser Trp Phe
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Pro Leu Ala Asp Arg Asn Pro Gln Gln Phe Met Asn Val Tyr Glu Ala
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cag tta cat gct caa aca gct gcc gac tcg gct tat gtt aga gat cat 156
Gln Leu His Ala Gln Thr Ala Ala Asp Ser Ala Tyr Val Arg Asp His
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Phe Thr Ala Ile Tyr Ser Pro Lys Asp Lys Ser Lys Lys Tyr Pro Val
    50                  55                  60

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Ile Phe Val Tyr Gln Asp Val Arg Gly Lys Trp Met Ser Glu Gly Asp
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Phe Glu Asp Ile Arg Pro Thr Thr Tyr Ser Lys Asp Lys Lys Ala Ile
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Asp Glu Ser Thr Asp Thr Tyr Asp Ala Leu Glu Trp Leu Gln Lys Asn
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Leu Lys Asn Tyr Asn Gly Lys Ala Gly Leu Tyr Gly Ile Ser Tyr Pro
145                 150                 155                 160

ggc ttc tat tct acc gtc gga ttg gtc aaa aca cac ccg agc ttg aag      588
Gly Phe Tyr Ser Thr Val Gly Leu Val Lys Thr His Pro Ser Leu Lys
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gca gtc tcc cca cag gct ccc gta aca gac tgg tat atc ggc gac gac      636
Ala Val Ser Pro Gln Ala Pro Val Thr Asp Trp Tyr Ile Gly Asp Asp
            180                 185                 190

ttc cac cat aat ggc gta ttg ttt ctt cag gat gca ttt aca ttc atg      684
Phe His His Asn Gly Val Leu Phe Leu Gln Asp Ala Phe Thr Phe Met
        195                 200                 205

tca acc ttt ggt gtc cct cgt cca aaa ccc att aca ccg gat caa ttt      732
Ser Thr Phe Gly Val Pro Arg Pro Lys Pro Ile Thr Pro Asp Gln Phe
    210                 215                 220

aag ggc aaa att cag atc aaa gaa gcc gat aaa tat aac ttt ttt gca      780
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225                 230                 235                 240
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gta caa ttt tgg aat gac ctg ttt aag cat ccc gac tat gat gat ttt      876
Val Gln Phe Trp Asn Asp Leu Phe Lys His Pro Asp Tyr Asp Asp Phe
            260                 265                 270

tgg aaa tcg cgt gtg atc acg aat tct tta cag gag gta aaa cca gct      924
Trp Lys Ser Arg Val Ile Thr Asn Ser Leu Gln Glu Val Lys Pro Ala
        275                 280                 285

gtg atg gtg gtt ggt ggt ttc ttt gac gcg gaa gat gct tat gga aca      972
Val Met Val Val Gly Gly Phe Phe Asp Ala Glu Asp Ala Tyr Gly Thr
    290                 295                 300

ttt aag acc tac caa tcg att gag gat aaa agc aaa aaa aac aac tcg     1020
Phe Lys Thr Tyr Gln Ser Ile Glu Asp Lys Ser Lys Lys Asn Asn Ser
305                 310                 315                 320

att tta gtc gcg gga cct tgg tat cat ggc ggt tgg gtt cgt gca gaa     1068
Ile Leu Val Ala Gly Pro Trp Tyr His Gly Gly Trp Val Arg Ala Glu
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gga aac tat tta ggt gat atc caa ttt gag aaa aaa acc agt att act     1116
Gly Asn Tyr Leu Gly Asp Ile Gln Phe Glu Lys Lys Thr Ser Ile Thr
            340                 345                 350

tat cag gaa caa ttt gaa caa cca ttt ttc aaa tat tac cta aaa gat     1164
Tyr Gln Glu Gln Phe Glu Gln Pro Phe Phe Lys Tyr Tyr Leu Lys Asp
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gaa gga aac ttc gcc cct tcc gaa gct aac att ttt gtt tca ggc agc     1212
Glu Gly Asn Phe Ala Pro Ser Glu Ala Asn Ile Phe Val Ser Gly Ser
    370                 375                 380

aac gaa tgg aaa cat ttc gaa cag tgg cca cca aaa aat gta gag aca     1260
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385                 390                 395                 400

aaa aaa cta tac ttc caa cct cag ggg aaa ctt gga ttt gac aaa gtt     1308
Lys Lys Leu Tyr Phe Gln Pro Gln Gly Lys Leu Gly Phe Asp Lys Val
                405                 410                 415

caa cgt aca gat tcc tgg gat gaa tat gta aca gac cct aat aaa cct     1356
Gln Arg Thr Asp Ser Trp Asp Glu Tyr Val Thr Asp Pro Asn Lys Pro
            420                 425                 430

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gta gat gat caa cgt ttc gcg gct agt cgc cct gat gtc atg gtt tat     1452
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    450                 455                 460

caa acg gaa ccg ttg acg gag gac ctg acg ata gta ggc cca atc aaa     1500
Gln Thr Glu Pro Leu Thr Glu Asp Leu Thr Ile Val Gly Pro Ile Lys
465                 470                 475                 480

aac ttt ctc aaa gtt tct tca aca gga aca gac gcg gac tat gtt gtc     1548
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                485                 490                 495

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Lys Leu Ile Asp Val Tyr Pro Asn Asp Ala Ala Ser Tyr Gln Gly Lys
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Thr Met Ala Gly Tyr Gln Met Met Val Arg Gly Glu Ile Met Ala Gly
        515                 520                 525

aaa tac cga aat ggt ttc gat aaa gcg cag gcc ttg act cca ggt atg     1692
Lys Tyr Arg Asn Gly Phe Asp Lys Ala Gln Ala Leu Thr Pro Gly Met
    530                 535                 540

gtc gaa aag gtg aat ttt gaa atg cca gac gtt gcg cat acc ttc aaa     1740
Val Glu Lys Val Asn Phe Glu Met Pro Asp Val Ala His Thr Phe Lys
545                 550                 555                 560

aaa gga cat cgc att atg gtt cag gta caa aac tca tgg ttt ccg ctg     1788
Lys Gly His Arg Ile Met Val Gln Val Gln Asn Ser Trp Phe Pro Leu
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gca gaa cga aat cca cag gtg ttt tta gca cct tat aca gct acc aaa     1836
Ala Glu Arg Asn Pro Gln Val Phe Leu Ala Pro Tyr Thr Ala Thr Lys
            580                 585                 590

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Ala Asp Phe Arg Lys Ala Thr Gln Arg Ile Phe His Asp Val Asn Asn
        595                 600                 605

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Phe Thr Ala Ile Tyr Ser Pro Lys Asp Lys Ser Lys Lys Tyr Pro Val
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Leu Leu Asn Arg Thr Pro Tyr Thr Val Ser Pro Tyr Gly Gln Asn Glu
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Tyr Lys Lys Ser Leu Gly Asn Phe Pro Gln Met Met Arg Glu Gly Tyr
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100 105 110

Phe Glu Asp Ile Arg Pro Thr Thr Tyr Ser Lys Asp Lys Lys Ala Ile
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Leu Lys Asn Tyr Asn Gly Lys Ala Gly Leu Tyr Gly Ile Ser Tyr Pro
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Gly Phe Tyr Ser Thr Val Gly Leu Val Lys Thr His Pro Ser Leu Lys
165 170 175

Ala Val Ser Pro Gln Ala Pro Val Thr Asp Trp Tyr Ile Gly Asp Asp
180 185 190

Phe His His Asn Gly Val Leu Phe Leu Gln Asp Ala Phe Thr Phe Met
195 200 205

Ser Thr Phe Gly Val Pro Arg Pro Lys Pro Ile Thr Pro Asp Gln Phe
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225 230 235 240

Glu Ala Gly Thr Ala Arg Glu Leu Lys Glu Lys Tyr Phe Gly Asp Ser
245 250 255

Val Gln Phe Trp Asn Asp Leu Phe Lys His Pro Asp Tyr Asp Asp Phe
260 265 270

Trp Lys Ser Arg Val Ile Thr Asn Ser Leu Gln Glu Val Lys Pro Ala
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290 295 300

Phe Lys Thr Tyr Gln Ser Ile Glu Asp Lys Ser Lys Lys Asn Asn Ser
305 310 315 320

Ile Leu Val Ala Gly Pro Trp Tyr His Gly Gly Trp Val Arg Ala Glu
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Tyr Gln Glu Gln Phe Glu Gln Pro Phe Phe Lys Tyr Tyr Leu Lys Asp
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Glu Gly Asn Phe Ala Pro Ser Glu Ala Asn Ile Phe Val Ser Gly Ser
370 375 380

Asn Glu Trp Lys His Phe Glu Gln Trp Pro Pro Lys Asn Val Glu Thr
385 390 395 400

Lys Lys Leu Tyr Phe Gln Pro Gln Gly Lys Leu Gly Phe Asp Lys Val
405 410 415

Gln Arg Thr Asp Ser Trp Asp Glu Tyr Val Thr Asp Pro Asn Lys Pro
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Val Pro His Gln Gly Gly Val Ile Gln Asn Arg Thr Arg Glu Tyr Met
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450 455 460

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485 490 495

Lys Leu Ile Asp Val Tyr Pro Asn Asp Ala Ala Ser Tyr Gln Gly Lys
500 505 510

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Lys Tyr Arg Asn Gly Phe Asp Lys Ala Gln Ala Leu Thr Pro Gly Met
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Val Glu Lys Val Asn Phe Glu Met Pro Asp Val Ala His Thr Phe Lys
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Lys Gly His Arg Ile Met Val Gln Val Gln Asn Ser Trp Phe Pro Leu
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Ala Glu Arg Asn Pro Gln Val Phe Leu Ala Pro Tyr Thr Ala Thr Lys
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